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(54) BUILDING CONSTRUCTION

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BRUCE BRIDGMAN

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(57) Claim

1. A method of forming a building construction comprising attaching a plurality of overlapping members to a suitable support structure including a plurality of uprights which includes the step of attaching together said members in their mutually respective overlapping areas by utilizing a plurality of clips wherein each clip is in bearing contact with non exposed surfaces of said members intermediate a respective pair of adjacent uprights in such a manner that a wall formed from said plurality of overlapping members has one wall surface which is substantially free of exposed or visible portions of clips or other fasteners utilized in attachment of the overlapping members to the support structure.

12. A building construction including:
a support structure including a plurality of
uprights;
a plurality of overlapping members forming a wall
of said building construction attached to said
support structure wherein a front surface of said
wall is substantially free of exposed or visible
portions of clips or other fasteners utilized to
attach the overlapping members in their mutually
adjacent overlapping areas; and a plurality of
clips used to attach the overlapping members to
each other on a rear surface of said wall in said
mutually adjacent overlapping areas intermediate a
respective pair of adjacent uprights wherein said
clip is in bearing contact with non exposed
surfaces of said members.

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COMMONWEALTH OF AUSTRALIA

The Patents Act 1952-1971

APPLICATION FOR A PATENT

COMPLETE AFTER PROVISIONAL SPECIFICATION No. 84015/2/1000X

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R.
We, Reginald John WATSON, Kingston Ronald HORNSBY, and
Bruce Roger BRIDGEMAN,

84015

of Ern Harley Driver, Burleigh Gardens Industrial Estate,
Palm Beach, Queensland.

hereby apply for the grant of a Patent for an invention entitled
METHOD OF BUILDING CONSTRUCTION AND APPARATUS USED IN
METHOD.

APPLICATION, ACCEPTED AND AMENDMENTS

ALLOWED 22 1. 81

which is described in the accompanying Provisional/Complete
specification.

My address for service is: G.R. CULLEN & COMPANY, Patent
Our Attorneys, of 289 Queen Street, Brisbane, in the State of
Queensland, Commonwealth of Australia.

DATED this THIRD day of JUNE 1981

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By Patent Attorneys,
G.R. CULLEN & COMPANY

R.T. Kelly

TRADE MARKS
SUB-OFFICE
- 3 JUN 1981
BRISBANE

To:
The Commissioner of Patents,
Commonwealth of Australia.

(Actual Inventor(s))

Regulation '2(1)

COMMONWEALTH OF AUSTRALIA

Patents Act, 1952-69

DECLARATION IN SUPPORT OF AN APPLICATION
FOR A PATENT.

84015

In support of the Application

made by REGINALD JOHN WATSON, KINGSTON RONALD HORNSBY and ROGER BRUCE
BYRDSON

for a patent for an invention entitled:

METHOD OF BUILDING CONSTRUCTION AND APPARATUS USED IN METHOD

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26 Southern Cross Drive, Cronin Island, Surfers Paradise, Q. 4217
respectively

do solemnly and sincerely declare as follows:-

• ~~I-48~~ We are the applicant(s) for the patent.

2. ~~I am~~ We are the actual inventor(s) of the invention.

Declared at Gold Coast this 19th day of May, 1978.

W. R. Howard

Signatures of Declarants

82 Ann G.R. CULLEN & COMPANY,
289 Queen Street, Brisbane,
Queensland, Australia.

To: Commissioner of Patents
Commonwealth of Australia.

2000-72 contains the
same words made under
section 44

84015-82

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COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:

METHOD OF BUILDING CONSTRUCTION AND APPARATUS USED IN METHOD

The following statement is a full description of the invention including the best method of performing it known to us:

THIS INVENTION relates to a method of building construction and more particularly to a method of attachment of boards, sheets, planks or strips to a suitable support structure which may include a wall, or wall frame, which may suitably comprise a plurality of studs 5 or uprights. The invention also includes apparatus for use in the method and a building construction constructed by the method.

Hitherto the conventional method of attaching overlapping planks to a plurality of upstanding studs was by nailing "under the lap", (i.e. in the overlapping region of the inner or top plank 10 which was obscured by the outer or bottom plank) and also by nailing through the base portion of the bottom plank. The exposed nails or screws at the base portion of the bottom had a tendency to lose their holding power as the various timber or metal members of the building structure to which the planks were attached expanded or 15 contracted due to changes in temperature or moisture content which caused the nail holes to become enlarged. This in turn caused a film of paint which had subsequently been applied to the overlapping boards to peel away from the nail heads necessitating rectification or restorative work to be carried out.

20 An additional disadvantage of this conventional method was that nailing through the exposed face of the building plank was often unsatisfactory due to the fact that the building plank may have had a pre-applied decorative finish or coating and the appearance of a plurality of nail heads in the decorative finish or coating was consider- 25 ed to be unsightly especially in relation to a wall having an exposed decorative surface formed by a multiplicity of overlapping planks having the decorative finish applied to their respective outer surfaces.

A further disadvantage of the conventional method was that in achieving a uniform overlapping of the planks it was normally 30 necessary to nail a suitable gauge to the planks which after removal left a series of undesirable and unnecessary holes in the outer faces of the planks. Alternatively gauge lines were sometimes marked on the boards as guidelines for uniform overlapping and this also adversely affected the resulting appearance of a wall formed from the overlapping 35 boards.

3.

It was also found in relation to the above described conventional method that such method was time consuming in execution and was therefore found uneconomic in some cases.

5 It is therefore an object of the invention to provide a method and means whereby the abovementioned disadvantages of the prior art are alleviated.

The invention provides a method of forming a building construction comprising attaching a plurality of overlapping members to a suitable support structure 10 including a plurality of uprights which includes the step of attaching together said members in their mutually respective overlapping areas by utilizing a plurality of clips wherein each clip is in bearing contact with non exposed surfaces of 15 said members intermediate a respective pair of adjacent uprights in such a manner that a wall formed from said plurality of overlapping members has one wall surface which is substantially free of exposed or visible portions of 20 clips or other fasteners utilized in attachment of the overlapping members to the support structure.

20 The method of the invention suitably is particularly applicable to the situation wherein overlapping strips or boards or sheets are attached to a building support frame including a top plate or top rail and a bottom plate or bottom rail and a plurality of upright 25 members or studs interconnecting the top and bottom rail.

However, this of course is not essential and the method of the invention can be utilized in the situation where the

3a.

- support structure is a sheet or wall or any other type of support structure.

Preferably each overlapping member to be utilized in the method of the invention includes a line of spaced 5 holes or apertures or sockets to which the respective upper portions of each clip may be attached by the use of a suitable elongate fastening member such as rivet member or screw member.

Preferably the screw member has a head located at 10 one end and a screw threaded shank and is operatively associated with a resilient sleeve preferably having substantially the same diametter as the screw

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20

25



head and adapted to be inserted onto said shank. There also may be used a non-resilient sleeve which preferably has the same diameter as the screw head, a compression washer and a nut. The arrangement is suitably such that the screw member may be inserted into its mating socket which is counter sunk to accommodate the screw head.

5 The line of spaced holes or sockets referred to above may be imparted to each overlapping member prior to attachment to the support frame and this may be carried out by use of a suitable template.

Suitably the line of sockets is located at a predetermined distance 10 from one edge (i.e. the lower edge in use) of each member and the spacing of each socket is also substantially uniform. The height of said line of sockets may be varied depending upon the particular job.

If necessary a plurality of substantially parallel lines of sockets 15 may be imparted to each member but a single line is preferred.

Preferably each clip utilised will have a plurality of holes or attachment apertures (suitably two) in its upper portion which gives flexibility and versatility when selecting which hole will be aligned with a mating socket before attachment to the screw member. In this context it will be appreciated that a normal lap variation in most 20 cases is about 20-40 mm. Hence it is only normally necessary to take into account a 20 mm variation in lap height.

When attaching the clip to the rear surface of an associated overlapping member by insertion of the screw member within its mating socket in a press fit relationship the screw is suitably already attached 25 to its respective clip and the screw may be pushed into its socket manually such as by use of a socket type screw driver, punch or spanner which engages with the nut of the screw member, which nut is located adjacent to a free or exposed face of the upper portion of the clip. When the screw member is pushed into its mating socket the resilient 30 sleeve tends to expand around the head of the screw member which provides a tightening effect in relation to the engagement of the screw within the socket.

In utilizing the clipping method of the invention as described above preferably before the clipping operation the bottom board or 35 plank is nailed or screwed to an adjacent stud at the top edge thereof.

When attaching a top board or plank to the bottom board the clips are preferably utilized at locations intermediate mutually adjoining studs. This operation may then be repeated until a wall formed from said overlapping members is formed having a front surface which has

5 no visible portions of clips, nails screws or other fasteners.

The invention also includes within its scope a building construction including an assembly of overlapping members attached to a support structure which are clipped together as described above.

~~The invention may also include within its scope the combination~~

10 ~~of clip, screw member and resilient washer as described above, which may optionally include the compression washer and nut~~

In another embodiment of the invention the clip may be modified for use with the bottom plank of a wall formed from a plurality of overlapping planks wherein the clip includes a vertical upper portion adapted to be interposed between the rear surface of the bottom plank and a suitable spacer which spaces the bottom plank from the adjacent stud. In this embodiment the clip may also include a substantially horizontal portion which may be attached to the underside of the bottom plate by a screw or nail. The vertical upper portion of the clip, 20 may be attached to the rear surface of the bottom board by an elongate fastening member engaging through an aperture in the upper portion and an aligned socket in the same manner as previously described.

Reference will now be made to the accompanying drawings wherein:

25 FIG 1 is an exploded view of the screw member utilized in the method of the invention;

FIG 2 is a sectional view of the screw member shown in FIG 1 when installed in a mating socket;

30 FIG 3 is a perspective view of a wall constructed in accordance with the method of the invention;

FIG 4 is a side view of the wall shown in FIG 3;

FIG 5 is a plan view showing the attachment of external corner members to the support structure in accordance with the method of the invention;

35 FIG 6 is a plan view showing the attachment of internal corner members to the support structure in accordance with the method of

the invention;

FIG 7 is a sectional view showing the attachment to each other of overlapping members;

FIG 8 is a view of a rivet member used in the attachment 5 of overlapping members shown in FIG 7;

FIG 9 is a view of the rivet member of FIG 8 after severing of the mandrel by a rivet gun.

FIG 10 is a perspective view of one type of clip utilized in the method of the invention;

10 FIG 11 is a perspective view of another type of clip utilized in the method of the invention;

FIG 12 is a perspective view of a slide joint utilized in the method of the invention; and

15 FIG 13 is a perspective view of another type of clip utilized in the method of the invention.

In the drawings there is shown a screw member having shank 1 and head 6, resilient sleeve 2 made from any resiliently deformable material such as plastic material or rubber, non-resilient sleeve 3 made from rigid material, compression washer 4 and nut 5. The engagement of 20 the screw member in socket 5A of plank 8 is shown in FIG 2.

There is also shown a wall forming from overlapping planks 8 in FIG 3 wherein clips 9 are utilized to interconnect planks 8 as shown in FIG 4 intermediate studs 7. The planks 8 are also nailed directly to the studs 7 as shown at 10.

25 Clip 9 as shown in FIGS 7 and 11 includes a vertical upper portion 11, a web portion 12, a lower portion 13, having bottom flange 14 which acts in conjunction with lower portion 13 as a tension spring to hold the planks firmly. There is also shown apertures 15 which may be variable in number according to the lap length L shown in FIG 7. Clip 9 30 as shown in FIG 7 interconnects an outer plank 8A to an inner plank 8B by an appropriate fastening member which may be the screw member shown in FIGS 1-2 or a rivet member 29 as hereinafter described.

In FIG 4 there is shown bottom plank 8C being attached to adjacent bottom plate 21 by clip 20. Clip 20 as shown in FIG 13 has 35 upper portion 19 and lower portion 18 attached to the underside of

bottom plate 21 by a nail through aperture 16. Upper portion 19 is attached to plank 8C as previously described for upper portion 11 of clip 9 and for this purpose has attachment apertures 15.

In FIG 5 there is shown corner stud 7 of the support structure 5 which has external corner member 14E attached thereto through the agency of metal angle member 14A attached to corner member 14E, and which is nailed to stud 7 at 14B and 14C.

In FIG 6 there is shown internal corner member 14F having metal angle member 14A attached thereto which is nailed to adjacent studs 10 7 at 14B and 14C as shown.

In both FIGS 5 and 6 planks 8 are shown attached to corner members 14E and 14F and studs 7 and the attachment to corner members 14E and 14F may be facilitated by the use of silicone sealant.

In FIGS 7-9 the attachment of overlapping planks 8A and 8B 15 is shown by the use of rivet members 29 which preferably are of the break head type including mandrel or shank 30, head 31, mandrel break point 32 and ball 33. Before installation rivet member 29 has the appearance as shown in FIG 8. During installation by a conventional rivet gun the mandrel 30 is severed at break point 32 and this means 20 that the ball or bulb 33 of rivet 29 is retained in the base portion of socket 5A thus facilitating retention of the rivet in the socket 5A. This is in contrast to conventional break stem or pop-rivets wherein the ball or bulb of the rivet is pulled upwardly until sufficient resistance is met in the substrate. The use of break-head rivets is 25 therefore to be preferred in relation to overlapping boards 8 formed from fibrous material.

The clip shown in FIG 10 includes upper portion 25 having attachment apertures 15, web 26, portion 27 and rearwardly extending part 28. This clip is used in situations where there is insufficient room above 30 the adjacent plank 8A to allow the use of the clip shown in FIG 11 to be manoeuvred to engage plank 8B. This occurs in under sill projections or under eaves soffits.

The slide joint shown in FIG 12 is used for all butt joints which may be made adjacent to studs 7 or between studs 7. The

slide joint comprises planar portion 24 and U shaped upper portion 23. The slide joint is simply pushed down adjacent the rear surface of the wall formed by overlapping planks 8 so that part 23 engages with the top of the plank and part 23 engages in the overlapping area between planks 8 as shown in FIG 3. The use of the slide joint provides a watertight joint and is not visible from the front of the wall.

From a review of the foregoing it will be clear in relation to the preferred embodiment of the invention that there is provided a 10 method of fastening of overlapping members to a support to form a wall which satisfactorily eliminates nailing or screwing of the overlapping members to the support through exposed surfaces.

It will also be appreciated that the invention, as described above in the preferred embodiment, provides a method of self alignment 15 of the boards, sheets, or planks which may comprise the overlapping members and this reduces the labour time required to attach the said boards, sheets or planks to the support.

Furthermore, the preferred embodiment of the invention as described above provides a self gauging method of attachment of the 20 boards, sheets or planks to the support to ensure that all boards, sheets or planks are evenly spaced and the desired overlap is maintained, thereby satisfactorily eliminating the need for lap lines or lap gauges.

Finally, it will also be appreciated that the elongate member referred to above which preferably is in the form of a screw member 25 or rivet member can be utilized in relation to boards, sheets or planks which are manufactured from material which has little or no screw or nail holding capacity such as boards made from fibrous material such as cellulose or asbestos cement.

The claims defining the invention are as follows:

1. A method of forming a building construction comprising attaching a plurality of overlapping members to a suitable support structure including a plurality of uprights which includes the step of attaching together said members in their mutually respective overlapping areas by utilizing a plurality of clips wherein each clip is in bearing contact with non exposed surfaces of said members intermediate a respective pair of adjacent uprights in such a manner that a wall formed from said plurality of overlapping members has one wall surface which is substantially free of exposed or visible portions of clips or other fasteners utilized in attachment of the overlapping members to the support structure.
2. A method as claimed in claim 1 wherein each clip used in the attaching step includes an upper portion including one or more attachment apertures for engaging with a rear surface of an outer or top overlapping member, a web portion and a lower portion which is located adjacent to the rear surface of a bottom or inner overlapping member for resilient engagement therewith.

3. A method as claimed in claim 2 wherein each overlapping member includes a row of spaced holes or apertures or sockets to which the respective upper portions of each clip may be attached by a suitable elongate fastening member.
4. A method as claimed in claim 3 wherein the elongate fastening member is a break-head rivet including a rivet head, mandrel and ball whereby said rivet engages in an associated socket in an adjacent overlapping member wherein said ball is retained in a base portion of the socket in said rivet head after said mandrel is severed by a rivet gun.
5. A method as claimed in claim 3 wherein the elongate fastening member is a screw member engaged in a mating socket having a head located at one end and a threaded shank operatively associated with a resilient sleeve mounted on said shank, a non resilient sleeve located on said shank outwardly of said resilient sleeve, a compression washer located on said shank exteriorly of the socket and an outer retaining nut.
6. A method as claimed in claim 1 or 2 wherein a slide joint comprising a plate comprising a top portion having a cross sectional inverted U shape and a planar body portion is attached to a rear surface of said wall wherein said top portion engages with an upper portion of an adjacent member of

complementary shape and said planer body portion abuts a rear surface of said adjacent member.

7. A method as claimed in claim 2 or 3 wherein an additional clip utilized in the clipping step includes an upper portion for engaging with a rear surface of an adjacent overlapping member, a web and a rearwardly extending portion for engaging a lower part of the wall below said overlapping member of restricted dimensions such as an undersill projection or under eaves soffit.

8. A method as claimed in claim 1 or 2 wherein the bottom overlapping member of said wall is attached to the support structure by an angle clip having a substantially vertical part and a substantially horizontal part wherein said vertical part includes one or more attachment apertures and said horizontal part is attached to the underside of said support structure.

9. A method as claimed in claim 8 wherein there is provided a spacer interposed between the support structure and the vertical part of the angle clip.

10. A method as claimed in claim 1 or 2 wherein there are further provided one or more external corner members having an inwardly located rebate or groove having an angle member attached thereto including a pair of mutually adjacent flanges which are attached on mutually adjoining surfaces of an external corner of the support structure.

12.

11. A method as claimed in claim 10 wherein there is also provided an internal corner member having an angle member attached thereto including a pair of mutually adjacent flanges which are attached to mutually adjoining faces of an internal corner of the support structure.
12. A building construction including:
a support structure including a plurality of uprights;
a plurality of overlapping members forming a wall of said building construction attached to said support structure wherein a front surface of said wall is substantially free of exposed or visible portions of clips or other fasteners utilized to attach the overlapping members in their mutually adjacent overlapping areas; and a plurality of clips used to attach the overlapping members to each other on a rear surface of said wall in said mutually adjacent overlapping areas intermediate a respective pair of adjacent uprights wherein said clip is in bearing contact with non exposed surfaces of said members.
13. A building construction as claimed in claim 12 wherein the clip includes an upper portion for engaging with a rear surface of an outer or top overlapping member, a web portion and a lower portion which is located adjacent to the rear

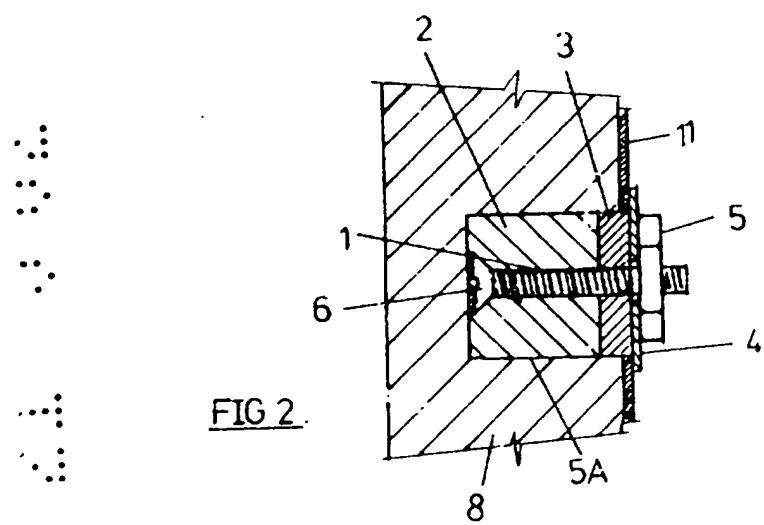
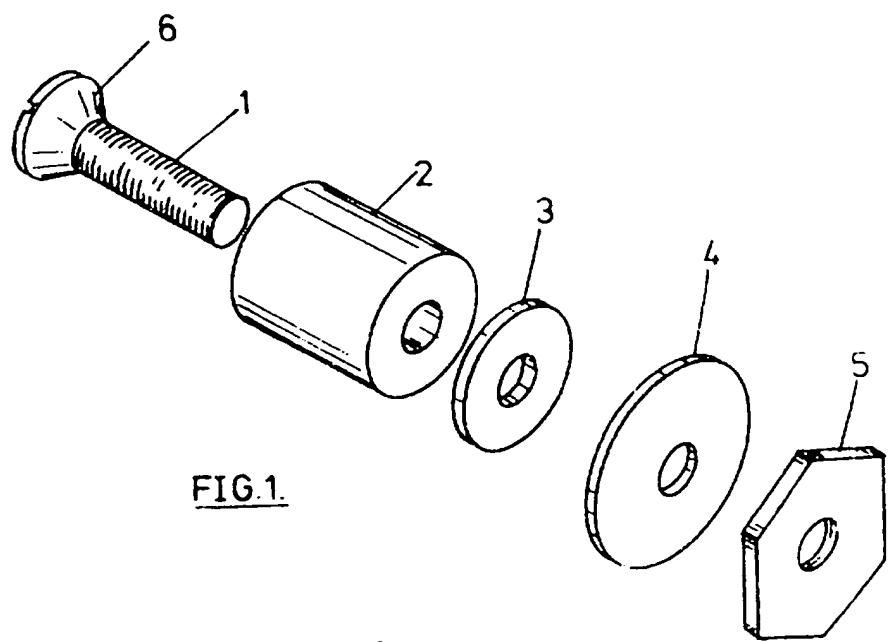
13.

surface of a bottom or inner overlapping member for
resilient engagement therewith.

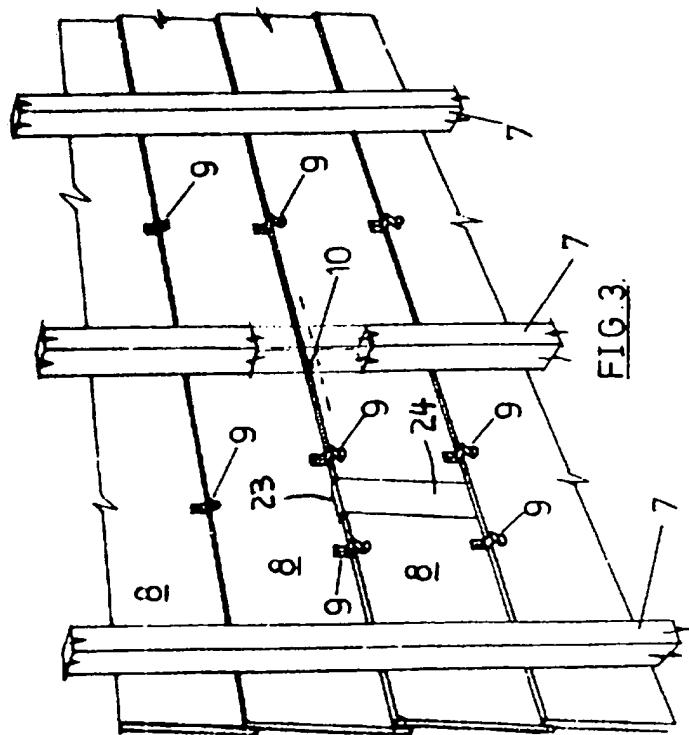
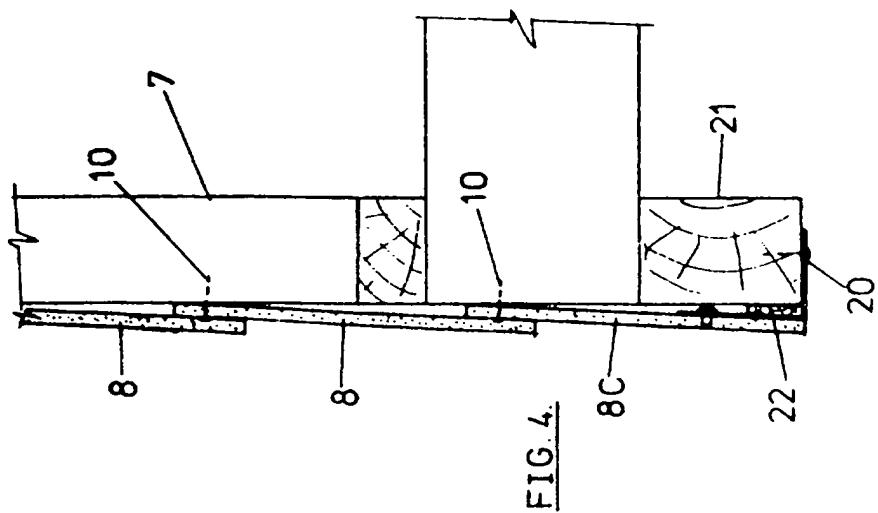
14. A building construction when formed by the method
of any one of claims 1 to 11.

DATED this Fifteenth day of January, 1987.

REGINALD JOHN WATSON, KINGSTON
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